Why is growing Baltimore's tree canopy important?

Most of us can't imagine a city without trees. Trees are an important part of our city like streets, lights, sidewalks and other city assets. Trees are our 'green' infrastructure – and the only infrastructure that increases in value. Trees are a good measure of the health and quality of life in our urban environment.

Baltimore's tree canopy is far below levels in the surrounding region and the recommendation by American Forests of 40% tree cover for healthy cities. TreeBaltimore was initiated by the Mayor to increase the number of trees planted and maintained. Healthy trees ultimately enhance the livability, economic stability and sustainability of the City.

Trees Increase Economic Stability

- Trees enhance community economic stability by attracting businesses and tourists.
- People linger and shop longer along tree-lined streets.

- Apartments and offices surrounded by trees rent more quickly and have higher occupancy rates.
- Businesses leasing office spaces in locations with trees find their workers are more productive and absenteeism is reduced.

(Michigan State University Extension, Urban Forestry #07269501, “Benefits of Urban Trees”)

Trees Increase Property Values

Property values increase 5-15% when compared to properties without trees (depends on species, maturity, quantity and location)

Trees Increase Sociological Benefits

Trees have the potential to reduce social service budgets, decrease police calls for domestic violence, strengthen urban communities, and decrease the incidence of child abuse according to the study. Chicago officials heard that message and spent $10 million to plant 20,000 trees, a decision influenced by two University of Illinois researchers (Kuo and Sullivan) who studied how well residents of the Chicago Robert Taylor Housing Project (the largest public housing development in the world) were doing in their daily lives based upon the
amount of contact they had with trees, and came to the following conclusions:

Trees Promote neighborliness Residents who live near trees have significantly better relations with and stronger ties to their neighbors.

Trees Reduce violence. Researchers have found fewer reports of physical violence in homes that had trees outside the buildings. Of the residents interviewed, 14% of residents living in barren conditions have threatened to use a knife or gun against their children versus 3% for the residents living in green conditions. (Prow, Tina., "The Power of Trees", Human Environmental Research Laboratory at University of Illinois).

Trees Improve Health. Studies show that hospital patients with a view of trees out their windows recover much faster and with fewer complications than similar patients without such views. (American Forests, "How Trees Fight Climate Change", 1999).

Trees Reduce Stress. A Texas A&M study indicates that trees help create relaxation and well being.

Reduce Air Temperature

On a hot, sunny summer day, the sun can heat dry, exposed urban surfaces, such as roofs and pavement, to temperatures 50–90°F (27–50°C) hotter than the air while shaded or moist surfaces remain close to air temperatures. (Berdahl P. and S. Bretz. 1997. Preliminary survey of the solar reflectance of cool roofing materials. *Energy and Buildings* 25:149-158)

Hotter temperatures also lend to greater production of ground-level ozone, also known as smog. Trees reduce temperatures two ways:

through shading and through transpiration (the emission of water vapor from the leaves).

Trees Reduce Urban Heat Island Effect.

Buildings in urban heat islands require more energy to cool. Trees help to cool cities by reducing heat sinks. Heat sinks are 6-19 degrees F° warmer than their surroundings (Global Releaf GA). A tree can be a natural air conditioner. The evaporation from a single large tree can produce the cooling effect of 10 room size air conditioners operating 24 hours/day. (USDA Forest Service Pamphlet #FS-363).

Trees Save Energy

Trees alter building use through the shading of building surfaces in winter and summer.

- Trees in the city of Baltimore are estimated to decrease building energy use by about 215,000 Mbtus ($799,000) and 3,300 MWh ($255,000) in the heating season and approximately 33,000 MWh ($2.24 million) in the cooling season, for net annual dollar saving in building energy use of about $3.3 million.
- Home and business owners who properly place trees in their landscape can realize savings up to 58% on daytime air conditioning. (American Forests, “The Case For Greener Cities”, Autumn 1999)

Trees Clean Our Air

Urban trees remove pollutants from the air—including nitrogen oxides, carbon monoxide, chlorine, fluorine halogens, ammonia, and ozone. Planting trees remains one of the cheapest, most effective means of drawing excess CO_2 from the atmosphere. (Prow, Tina., :The Power of Trees" , Human Environmental Research Laboratory at University of Illinois).

Trees Remove Pollutants. Baltimore's trees remove 701 metric tons of pollutants per year, saving approximately $3,757,000 annually, including: ozone, particulate matter, nitrogen dioxide, sulfur dioxide, and carbon monoxide

Trees Sequester carbon. Trees help to reduce the risks of climate change and they release oxygen as they photosynthesize. The trees of Baltimore store 527,300 metric tons (equivalent to the amount carbon emitted from Baltimore's population in about 54 days based on average per capita carbon emissions), with an estimated value of $10.7 million.

Trees Capture Carbon. Baltimore's trees capture a net 10,800 metric tons of carbon per year (after accounting for decomposition emission of carbon from dead trees), with an estimated value of $219,000.

Trees Clean and Protect Our Water

Trees reduce topsoil erosion, prevent harmful land pollutants contained in the soil from getting into our waterways, slow down water run-off, and ensure that our groundwater supplies are

continually being replenished. For every 5% of tree cover added to a community, stormwater runoff is reduced by approximately 2%. (Coder, Dr. Kim D., Identified Benefits of Community Trees and Forests", University of Georgia, October, 1996).

Trees Filter Rainwater. Reduced stormwater runoff reduces pressure on wastewater treatment facilities, reduces the risk of localized flooding, reduces toxins and particulates from flowing into streams and eventually into the Chesapeake Bay

Trees Reduce Flooding. USFS shows that in a 1-inch rainstorm over 12 hours, the interception of rain by the canopy of the urban forest in Salt Lake City reduces surface runoff by about 11.3 million gallons, or 17%. These values would increase as the canopy increases. (American Forests, "How Trees Fight Climate Change", 1999).

Trees Lengthen Road Repaving Cycle from 7-10 years to 20-25 years

The asphalt paving on streets contain stone aggregate in an oil binder. Without tree shade, the oil heats up and volatizes, leaving the aggregate unprotected. Vehicles then loosen the aggregate and much like sandpaper, the loose aggregate grinds down the pavement. Streets should be overlaid or slurry sealed every 7-10 years over a 30-40 year period, after which reconstruction is required.

A slurry seal costs approximately $0.27/sq.ft. or $50,000/linear mile. Because the oil does not dry out as fast on a shaded street as it does on a street with no shade trees, this street maintenance can be

deferred. The slurry seal can be deferred from every 10 years to every 20-25 years for older streets with extensive tree canopy cover. (Tree Guidelines for San Joaquin Valley Communities, March 1999. Published by the USDA Forest Service's Western Center for Urban Forest Research and Education).

Trees Slow traffic

Trees can also enhance traffic calming measures, such as narrower streets, extended curbs, roundabouts, etc. Tall trees give the perception of making a street feel narrower, slowing people down. Closely spaced trees give the perception of speed (they go by very quickly) slowing people down. A treeless street enhances the perception of a street being wide and free of hazard, thereby increasing speeds. Increased speed leads to more accidents.

Trees Reduce Noise

A U.S. Department of Energy study reports that trees reduce noise pollution by acting as a buffer and absorbing 50% of urban noise.

Trees Provide Wildlife Habitat

Trees provide shelter and food for wildlife, including migratory birds and butterflies.

Trees Improve aesthetics

Well-maintained trees look nice and tree lined streets increase outdoor activity, neighborliness, property values, tourism and more.

Trees Improve Our Quality of Life

Trees reduce noise pollution, provide shade and protect our skin and eyes from harmful sun damage. They absorb carbon dioxide while providing oxygen. Trees foster pedestrian-friendly streets, provide recreation opportunities, can be used as traffic calming devices and contribute to softening and beautifying the urban landscape where we live and work.
